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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Chemical characterization of springtime submicrometer aerosol in Po Valley, Italy" *by* S. Saarikoski et al.

Anonymous Referee #2

Received and published: 18 July 2012

The article entitled "chemical characterization of springtime sub micrometer aerosol in Po Valley, Italy" contains a carefully analysis of aerosol sources in Po Valley, one of the most important European hot spots in terms of air pollution. The article contains new information, is well written and deserves publication in ACP. Below a list of remarks that the authors should consider before the article is accepted for publication.

General remarks: 1) At several places in the text the authors refer to "good' and "bad" correlations. Please use the terms statistically significant or not accompanied by statistical tools (t-test).

2) In several figures especially in figs 1, 5, 6 and 7 please mark with a horizontal line the periods (I, II, III etc) referred in the manuscript, page 8283. It will greatly help the readers to follow the species variability.

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3) Did the authors measured BDL variation? Figure 10 and Table 1 comment on the behavior of several compounds before and after its nocturnal break-up but no explanation on how this break was defined is given in the manuscript. See also paragraph 3.4 lines 17-21.

Other remarks: Line 21, page 8272: The authors should better describe the aim of their work, the way they did is quite vague. Lines 8 and 22 pages 8274: Did the authors correct their OC and WSOC values for blanks or they consider them quite low. Please specify? CE: As collection efficiency is species dependant why they don't correct values based on the relations with filters? My remark goes especially to sulfate showing the biggest discrepancy with filters (factor of 2). I don't see the interest in presenting sulfate levels of the order of 0,9 ug/m3 or lower which are definitively wrong for a continental European area. Modelers can make use of these results (line 6 page 8284)or simply by referring figure 2. Line 23, page 8283, Define stars and arrows at caption of figure 2. Figure 4, explain color scale with dates at figure caption. Line 27, page 8289, no measurements of solar radiation are available from a regional meteorological office? The word "supposed to be pretty steady" is not adequate. Line 14, page 8290, any explanation on the moderate correlation between biomass burning tracers and nss-K? Lines 23-26, page 8291. Is there any correlation between HOA and NOx? Please clarify as first sentence (line 23) says "strong correlation" and the second (line 25) "quite small". Line 7, page 8292. The statement "OOA-a is a clear regional component" is not clear why. The authors explain it further but here is not clear at all. Line 10, page 8297: N-OA change reported by authors is not clear in figure 10c.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 8269, 2012.